Remarks

Claims 1-6 are pending in the application. Claims 1-3, 5, and 6 are rejected, and claim 4 is objected to.

In paragraphs 1-2, the Examiner rejects claims 4 under 35 USC 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art what the invention is.

The Examiner states that claim 4 "discloses a probability function that is not disclosed in the specification."

To the contrary, at page 38 and 39, the specification discloses a "probability function." This element is also clearly shown in Figure 13 as item 1305. In addition, probability functions have been known for centuries. There is no requirement that the specification needs to derive or explain what is well known to those of ordinary skill in the art. To those of ordinary skill in the art, a probability function is no more mysterious than, lets say, a cosine function.

But, for the Examiner's benefit, a probability function $P(x)$, also known as a probability density function, denoted PDF, or density function, of a continuous distribution is formally defined as a derivative of a cumulative distribution function $D(x)$.

$$D(x) = P(X \leq x) \equiv \int_{-\infty}^{x} P(y)\, dy.$$

so

$$D(x) = P(X \leq x) \equiv \int_{-\infty}^{x} P(y)\, dy.$$

A probability function satisfies

$$P(x \in B) = \int_{B} P(x)\, dx$$

and is constrained by the normalization condition,

$$P(-\infty < x < \infty) = \int_{-\infty}^{\infty} P(x)\, dx \equiv 1.$$

One well known PDF is a Gaussian distribution, although many others are also possible. Which PDF to use is usually an implementation choice.

Furthermore, the specification describes the use of a probability function that determines the contribution (weight) of each vertex in each mesh to the corresponding cell in the ADF.

In processing range data, range values along a scanning direction perpendicular to a surface are more accurate than those taken obliquely or at a wide angle to the surface, this is well known. Therefore, when the range data from several viewpoints are combined, values should be weighted accordingly by the probability function so that range data along the optical axis has a greater contribution than range data at an oblique angle. As stated in the specification at page 38, "the probability function determines the contribution (weight) of each vertex in each mesh to the corresponding cell in

the ADF." And this is restated at page 37, "The probability function depends on the angle of each contributing triangle with the original scan direction, the location of the triangle relative to the edge of its scanned image, the degree of agreement between distances computed for overlapping range surfaces, and possibly other factors.

In paragraphs 3-8, the Examiner provisionally rejected claim 1-6 under the doctrine of double-type patenting. The Examiner states that "both generate and edit an adaptively sampled distance field."

Quite to the contrary, the present invention, in claim 1, generates an adaptively sampled distance field from the range data, and edits the adaptively sampled distance field to produce the model.

In contrast, US Application 09/810,841, ('841) generates its adaptively sampled distance field from a graphical model, and edits (deforms) a triangle model.

Applicants respectfully would like the Examiner to explain any relationship between generating from range data and generating from a graphical model. Certainly, the Examiner cannot mean that range data are the same as a graphical model, that is absurd. Similarly, editing a continuous distance field has nothing to do with editing a discrete triangle model. It is well known that a distance field is not a polygon model. The Examiner is respectfully

requested to reread pages 2 and 7 where polygons and distance fields are clearly distinguished.

Claim 2 converts an ADF derived from range data, while '841 converts a model derived from a graphical model.

Claim 3 converts range images to range meshes in a single coordinate system, and generates ADFs from the range meshes, while in '841 range data are ***never*** claimed.

Claim 5 and 6 has candidate cells derived from range data, while '841 is devoid from any mention of range data.

All rejections have been complied with, and applicant respectfully submits that the application is now in condition for allowance. The applicant urges the Examiner to contact the applicant's attorney at phone and address indicated below if assistance is required to move the present application to allowance. Please charge any shortages in fees in connection with this filing to Deposit Account 50-0749.

Respectfully submitted,

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